

2) INTRODUCTION

2.a Overview of the North American Waterbird Conservation Plan

The North American Waterbird Conservation Plan (NAWCP) (Kushlan et al. 2002) was developed to provide a continental scale framework for the conservation and management of the 210 waterbird species in 23 families that use aquatic environments throughout North and Central America, islands and pelagic waters of the Caribbean Sea and western Atlantic, and the U.S.-associated Pacific islands and pelagic waters of the Pacific. The overall vision of the plan is to sustain or restore the distribution, diversity and abundance of populations and habitats of breeding, migratory, and nonbreeding waterbirds throughout the lands and waters of North America, Central America, and the Caribbean. To achieve this vision, broad goals were established in four categories: species and populations; habitat; education and information; and coordination and integration.

There are several components of the NAWCP. These include identification of threats affecting waterbirds and their habitats, assessment of conservation risk that each species faces, assessment of the relative importance of specific areas to the various species, and assessment of effectiveness of waterbird management activities.

The NAWCP planning scale is broad, encompassing international and continental borders and, for some species, global populations. However, the plan recognizes that conservation effort must take place at multiple scales, including national, regional, state and provincial, and local levels. Because the geographic extent of the NAWCP is immense, the Plan area is organized into 16 regional planning areas. Regional boundaries are based on both political considerations and ecological factors; generally they are composites of terrestrial and pelagic Bird Conservation Regions (BCRs). BCRs are geographic areas with similar vegetative cover types, bird

communities and resource management issues, and were developed to provide a consistent spatial framework for strategies in the North American Bird Conservation Initiative (NABCI). NACBI links national and continental bird conservation plans, such as the North American Waterfowl Management Plan (NAWMP), the NAWCP, the Partners in Flight North American Landbird Conservation Plan, and US and Canadian Shorebird Conservation Plans, in order to maximize effectiveness and efficiency in reaching shared goals. .

2.b Vision for waterbird conservation in the Upper Mississippi Valley/ Great Lakes Region

The Upper Mississippi Valley / Great Lakes (UMVGL) Region is used by 46 regularly-occurring waterbird species throughout the year, including 18 species that are of high conservation, stewardship or management concern (see Chapter 3). The vision of the UMVGL Waterbird Conservation Plan is to maintain and restore waterbird distribution, abundance and habitats throughout the Plan area. The goal is to provide recommendations, based on assessment of best available data and expert opinion, that better focus regional conservation efforts and result in robust, self-sustaining waterbird populations throughout their historic or naturally expanding ranges in the UMVGL Region. Additionally, these recommendations can be integrated with those developed for waterbirds in other regions, those for other groups of aquatic birds such as waterfowl and shorebirds, and those developed for all bird conservation.

Conservation recommendations that result in robust waterbird populations must be developed with a sound scientific foundation. To this end, this Plan will:

1. Compile and present data on waterbird population abundance, distribution and trends to the extent they are available for each species breeding in the Region (*These data will be compiled for migrant and wintering birds in Volume 2 of the plan*)

2. Assess conservation, stewardship and management priority for each species breeding in each BCR in the Region, including determining importance of each BCR to each species
3. Develop population objectives for species to guide management and that can support the development of habitat objectives
4. Describe the principle threats and issues associated with waterbird conservation in the Region
5. Identify habitat needs for species, the availability of this habitat in the Region, and approaches to habitat conservation, as well as major areas important for waterbirds
6. Identify key data gaps that are fundamental for species conservation
7. Identify conservation strategies for priority waterbird species/groups in the Region
8. Describe major areas that provide waterbird habitat in the Region and identify important waterbird sites
9. Provide important links to other bird plans

This plan focuses on breeding populations of birds. Data and recommendations for migrant and wintering birds will need to be part of future planning efforts.

2.c Description of UMVGL Region

2.c.i Location

The UMVGL waterbird planning region encompasses 1,879,965 square kilometers (725,854 square miles) in the north-central U.S. and south-eastern Canada (P. Blancher, Bird Studies Canada, pers. comm.). The plan area includes all or most of Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio, and Wisconsin; and portions of Alabama, Arkansas, Kansas, Manitoba, Nebraska, Oklahoma, Ontario, Pennsylvania, Quebec, South Dakota, Tennessee, and Vermont (Figure 1). The Great Lakes and “Big Rivers”

(Mississippi, Illinois, Ohio and Missouri) provide much of the significant waterbird nesting, roosting and foraging habitats in the Region.

2.c.ii Bird Conservation Regions and physical description

The planning region includes the following BCRs: Boreal Hardwood Transition (BCR 12), Lower Great Lakes/St. Lawrence Plain (BCR 13), Eastern Tallgrass Prairie (BCR 22), Prairie-Hardwood Transition (BCR 23), and Central Hardwoods (BCR 24). Below are descriptions of each of these BCRs, based on full descriptions provided by NABCI (2000).

Boreal Hardwood Transition (BCR 12): This BCR is the largest of the five BCRs included in the plan, encompassing 611,293 km² (235,959 miles²), approximately 33% of the UMVGL area. The bulk (64%) of this BCR occurs in southern Ontario and Quebec (Figure 1). Coniferous and northern hardwood forests, nutrient-poor soils, and numerous clear lakes, bogs and river flowages characterize the region. Many breeding and migratory waterbirds use Great Lakes coastal marshes, islands, deep water lakes, river flowages, large shallow lakes and natural wild rice lakes.

Lower Great Lakes/St. Lawrence Plain (BCR 13): This BCR encompasses 201,292 km² (77,699 miles²), approximately 11% of the UMVGL area. The region includes low-lying areas south of the Canadian Shield and north of various highland systems in the U.S., with a little more than half of the area (56%) occurring in Canada (Figure 1). Important areas for waterbirds include lakeshores and associated wetlands. This region was originally covered with a mix of oak-hickory, northern hardwood, and mixed-coniferous forests, but forest clearing for agriculture has converted much of this landscape to cropland. In recent years, some farmed areas have reverted to early successional forest types or have been lost to urbanization. This region is

extremely important to staging migrants and attracts some of the largest concentrations of migrant waterbirds and shorebirds in eastern North America.

Eastern Tallgrass Prairie (BCR 22): This BCR is the second largest in the planning Region, encompassing 535,271 km² (206,615 miles²), approximately 28% of the UMVGL area (Figure 1). It is dominated by agriculture, but once consisted of vast areas of prairie and savannah, and included the tallest and lushest grasslands in the Great Plains. This region provides wetland, marsh and island habitats that are important for multiple waterbird species. However, ongoing urbanization, recreational development and agricultural expansion pose significant threats to the upland and wetland habitats on which these birds rely.

Prairie Hardwood Transition (BCR 23): This BCR encompasses 229,498 km², (88,586 miles²), approximately 12% of the UMVGL area (Figure 1). It was formerly dominated by prairie in the west and south, and beech-maple forest in the north and east. Glaciation left multiple pothole-type wetlands and shallow lakes. Many of the rivers in this BCR end in the coastal estuaries of the Great Lakes. This is an important area for breeding waterfowl and waterbirds, with lakeshore-wetland habitats ranging from emergent marshes and diked impoundments to normally ice-free deepwater habitats.

Central Hardwoods (BCR 24): This BCR encompasses 302,611 km² (116,808 miles²), approximately 16% of the UMVGL area (Figure 1). It is dominated by oak-hickory forest; the region includes some of the most extensive forests in the middle of the continent. The Ozark Mountains on the west and the Interior Low Plateaus on the east are bisected by the Mississippi River and its larger tributaries. The floodplains of the river systems are diverse, including forested and emergent wetlands and submerged aquatic beds, extremely important for migrating

wetland birds. Threats to these communities include agricultural conversion of floodplain and urbanization.

2.d Current waterbird conservation activities in the UMVGL Region

2.d.i Population inventory and monitoring.

Waterbird population inventory and monitoring has been conducted under multiple programs, time frames, spatial scales and formats by numerous agencies and organizations throughout the Region. To ascertain information for this plan on inventory and monitoring activities throughout the Region, information on broad-scale monitoring efforts (regional, national, continental) was obtained through electronic searches via the Internet and literature review. Additionally, state and provincial wildlife management agencies and selected waterbird biologists were surveyed using a questionnaire to determine the intensity of monitoring and inventory efforts in each of their state and provinces. For this latter effort, the response rate was low, either because respondents could not take the time to compile the needed information or their waterbird survey activities were limited. A summary of information obtained is shown in Table 2.1, and various programs are described below.

The North American Breeding Bird Survey (BBS; <http://www.mbr-pwrc.usgs.gov/bbs/bbs.html>) was initiated in 1966 and presently has hundreds of routes in the UMVGL Region. Data for the BBS are collected in June and provide information on distribution, relative abundance, and population trends for many bird species. Because the BBS is a roadside survey with the primary objective of estimating changes in songbird abundance (Sauer et al. 2005), it undersamples community types important for nesting waterbirds, such as wetlands and islands. Therefore, BBS data may not be appropriate for most waterbird species because. Additionally, the utility of the BBS for monitoring waterbirds that are seldom seen or

heard during nesting is limited. Nevertheless, for some waterbird species, BBS data may provide credible trend information and a starting point for conservation assessment (see Chapter 3).

Information collected in population and inventory efforts is vital for effective management and conservation of waterbird species throughout the Region. Colonial waterbirds have been the subject of large-scale monitoring efforts over much of the region for several decades, particularly in the Great Lakes. For breeding colonial waterbirds in the Great Lakes, the U.S. Fish and Wildlife Service (USFWS) and Canadian Wildlife Service (CWS) have coordinated three surveys spaced approximately ten years apart since the 1970s. This bi-national survey effort has collected enough data to assess changes in population numbers and distribution for several species (e.g., Double-crested Cormorant, Ring-billed Gull, Herring Gull, Great Black-backed Gull, Common Tern, Caspian Tern, Great Blue Heron, Great Egret, Black-crowned Night-Heron). Additionally, this survey effort has also compiled comprehensive data for relatively rare colonial waterbirds (e.g., American White pelican, Snowy Egret, Cattle Egret, Little Blue Heron). However, outside of the Great Lakes, efforts have not been well coordinated within and between States and Provinces.

Efforts to systematically monitor non-colonial species in the Region are more limited than those for colonials. Large-scale coordinated efforts for these species have been underway for roughly a decade and include the Great Lakes Marsh Monitoring Program and the National (U.S.) Marsh Bird Monitoring Program (NMBMP). The Great Lakes Marsh Monitoring Program is a cooperative venture initiated in 1994 by Environment Canada and Bird Studies Canada. The program coordinates citizen volunteers from the Great Lakes states and Ontario to monitor birds and amphibians of coastal and inland marshes in the Great Lakes Basin (Weeber and Vallianatos 2000). The NMBMP was initiated in 1999 primarily as a means of field-testing

protocols and relies on volunteer participants from 44 U.S. states, 1 Canadian province and 3 Mexican states. This program includes efforts of a variety of agencies and individuals, but the majority of participants (62%) are staff with the U.S. National Wildlife Refuge System (NWRS) or conduct surveys on Refuge lands (Conway 2004). The NMBMP survey protocol is still being refined. Neither of the marsh bird monitoring programs uses a statistically-based sampling framework, which limits the inferences that can be drawn from their data with respect to region-wide population status and trends. Several state- and provincial-level surveys are conducted in the Region for breeding Common Loons, as noted in Table 2.1.

For some waterbird species that are harvested in the U.S. and Canada, the USFWS conducts surveys to estimate population size and harvest level. For American Coot, Purple Gallinule, Common Moorhen, rails and Sandhill Crane, annual harvest information is provided in the U.S. through the Migratory Bird Harvest Information Program (HIP) conducted by USFWS Migratory Bird Management. In Canada, the CWS collects similar information through the National Harvest Survey of migratory bird hunters who purchase Canadian Migratory Bird Hunting Permits.

Some efforts to monitor birds in migration and winter are also undertaken in the UMVGL Region. Most efforts to monitor migrants are local and undertaken by regional bird observatories (see Table 2.2 for list of observatories). For waterbirds that winter in the Region, the primary monitoring effort is the Audubon Christmas Bird Count (CBC; <http://www.audubon.org/bird/cbc/index.html>). This survey originated in 1900 and is the oldest and largest wildlife survey in the world (Butcher 1990). The CBC is conducted in early-winter within 2 weeks of 25 December (Sauer et al. 1966, <http://www.mbr-pwrc.usgs.gov/bbs/cbc.html>). In the UMVGL Region, there are hundreds of CBC circles

(circular count areas). Data from this survey have been used to discern patterns of regional relative abundance for wintering North American birds (Root 1988). However, as is the case with BBS data, environments important for waterbirds may be undersampled within the UMVGL Region because of inaccessibility. Many islands and open water areas of the Great Lakes are very difficult to survey at this time of year but are used by multiple waterbird species for roosting (D.V. Weseloh, pers.comm.). These roosting areas and/or the flightlines that lead to them have been successfully censused in some local areas, e. g. the Niagara River (Bellerby et al. 2000, Kirk et al. In review)

2.d.ii Research

There is a wide variety of research projects underway across the UMVGL Region that addresses multiple aspects of waterbird conservation and management. The purpose of this section is not to describe all of these efforts, but to identify agencies and institutions involved in waterbird research, the focus of regional research efforts, and important gaps in our understanding of waterbird needs.

Major agencies/institutions and funding sources: Most of the waterbird research undertaken in the UMVGL Region is conducted by universities, non-governmental organizations, the U.S. Geological Survey (USGS), the Canadian Wildlife Service (CWS), and state and provincial agencies. In Canada, the federal government is responsible for research on all birds listed in the 1916 Migratory Birds Convention between the U.S. and Canada. This includes all waterbird species covered in this plan with the exception of the Double-crested Cormorant and the American White Pelican. The protection and management of these two species is the responsibility of the provinces (Keith 1995). However, the CWS does conduct studies on the impact these two species may have on birds that are listed in the treaty. The CWS

also conducts important large-scale research and monitoring to assess levels in and effects of contaminants on waterbirds in the Great Lakes (see Chapter 4.d, *Contaminants/Toxins*).

In the U.S., the U.S. Fish and Wildlife Service (USFWS) and the State Wildlife Grants program (SWG) fund much waterbird research work, either through targeted programs like the USFWS' Webless Migratory Game Bird Research Program, which provides funding for research on hunted species of rails, cranes, and coots, or through general small grant programs. The USFWS is building its capacity in the UMVGL Region for biological planning, modeling and the use of Geographic Information Systems that can guide Regional habitat conservation planning through landscape design. Research projects undertaken by these agencies and institutions range in scale from single species studies at local sites (e.g., predation on Great Blue Herons in metro-area colonies in Minnesota) to projects including multiple species across a broad geographic area (e.g., colonial waterbird detectability research in the Great Lakes).

Provincial and state projects. A significant amount of research that can be applied to the management of Double-crested Cormorants has been conducted in the UMVGL Region. Primarily efforts have been undertaken to assess impacts of cormorants on various resources, including vegetation, other colonial waterbirds, and especially sport fisheries. Some recently conducted or current large-scale projects include:

- Wisconsin: The Wisconsin DNR, USDA Wildlife Services and the University of Wisconsin initiated a cooperative 2-year study in 2004 on Green Bay to study food habits and foraging behaviors of cormorants, with an emphasis on determining the importance of yellow perch in cormorant diets. (S.Matteson, pers. comm.).
- Minnesota: The Leech Lake Reservation Division of Resource Management, Minnesota DNR, U.S. Department of Agriculture (USDA) Wildlife Services Program and

researchers from the University of Minnesota initiated a study in 2004 to better establish how cormorants might be impacting the lake's walleye and perch fisheries. Researchers are conducting a diet study to determine types and numbers of fish cormorants are consuming. This research is being funded through a Tribal Wildlife Research Grant from the USFWS. DNR biologists are also conducting a mark-recapture study on marked walleye fry to establish the level of natural reproduction in the lake. Results from these studies will be used to refine cormorant population goals for Leech Lake. (S. Mortenson, pers. comm.).

- Michigan: Researchers from Central Michigan University and Michigan State University developed a bioenergetics model for cormorants breeding in the Beaver Archipelago in northern Lake Michigan. Data for the model were collected between 2000-2004 and estimates were made of total prey consumption and impacts of cormorants on particular fish stocks. (N. Seefelt, pers.comm.).
- Michigan: The USFWS and researchers from the University of Minnesota tested aerial photography in 2005 as a method for monitoring cormorant colonies more regularly and effectively. (M. Koneff, USFWS)
- Ontario: The Ontario Ministry of Natural Resources initiated a multi-year research program to determine effects of cormorants on specific resource values, including effects on vegetation, other colonial waterbirds and fish stocks. The CWS has supported and contributed to this research. (B. Pollard, pers. comm.).

Identifying gaps: The effective management and conservation of waterbirds is limited by lack of knowledge about the state of waterbird populations and their habitat requirements. As a whole, research on waterbirds has not been as extensive as it has been for some other groups of

birds (e.g., waterfowl, songbirds). Identifying these gaps is a first step in assessing how well situated the UMVGL Region is to carry out priority conservation actions. Important gaps include: a lack of information on landscape attributes important to most breeding species, especially marsh birds; limited understanding of habitat needs for migrating and wintering waterbirds (both within and outside the Region); and an incomplete inventory of populations and important cover types (habitat) for many species, information that is essential for developing population and habitat objectives, and for monitoring results of conservation efforts.

2.d.iii Population management

The Region is engaged in several waterbird population management activities, which are undertaken at various scales. In the U.S., waterbirds are under federal jurisdiction. The USFWS collaborates with States in administrative structures called Flyways to determine harvest regulations for migratory game birds; among waterbirds, this includes rails, coots and Sandhill Cranes. Consideration is being given to expanding the role of Flyways to include regulatory issues related to nongame migratory birds (Bird Conservation Committee Nongame Migratory Bird Consultation Working Group 2005).

Management of wildlife in Canada is both a Federal and provincial responsibility. The provinces have exclusive jurisdiction over "property and civil rights," which is considered to include wildlife. The federal government has jurisdiction over transboundary issues and matters of national concern. Migratory birds cross international boundaries, and so are subject to international treaties and federal legislation if they are listed in the Migratory Birds Convention. The *Canada Wildlife Act* establishes how the federal Department of Environment (Environment Canada) will be involved in wildlife conservation and management of public lands for wildlife,

and is deferential to the provincial role in wildlife management, by requiring provincial agreement or cooperation for most undertakings (West Coast Environmental Law 2003).

Species-specific management. The Double-crested Cormorant is the only waterbird species in the Region for which there is a national management plan. In the U.S., the USFWS established a Public Resource Depredation Order in 2003 for cormorants in 24 states in the east and Midwest, including all of the states within the UMVGL Region. This order enabled state fish and wildlife agencies, Federally-recognized tribes, and USDA Wildlife Services to control, without a Federal permit, double-crested cormorants “committing or about to commit depredations on the public resources of fish, wildlife, plants, and their habitats” (USDI/FWS 2003b). Under this order, large-scale control programs have been initiated in most Great Lakes states, including Michigan, Minnesota, Ohio, Vermont and New York. Management in these states has included lethal control of several thousand breeding adults and egg oiling at selected colonies. In Canada, because cormorants were not included in the 1916 Migratory Birds Convention, and thus are under provincial jurisdiction, there is no national management plan for them. However, large-scale lethal control efforts are currently being undertaken in Ontario by provincial agencies (B. Pollard, pers. comm.). At Presqu’Ile Provincial Park, Ontario Parks has pursued an aggressive cormorant control program. In 2004, 2,098 nests were removed from trees, 3,284 ground nests were oiled, and 6,030 adult cormorants were culled on Gull and High Bluff Islands, Presqu’Ile Provincial Park (Ontario Parks 2005; http://www.ontarioparks.com/english/pres_planning.html). This is the largest local cormorant cull on the Great Lakes and on the continent.

Federal recovery plans have been written for two U.S. Federally-listed waterbird species that occur in the UMVGL Region, the Whooping Crane (Eastern population) and the Least Tern

(Eastern population). The Whooping crane is also a Federally-listed endangered species in Canada and a Canadian recovery plan has been developed as well; the U.S. and Canadian plans for this species are well-integrated. In addition, a recovery plan is being developed for the King Rail, a Federally-listed Endangered species in Canada. These plans are described below.

The goal of the King Rail Recovery Plan is to increase the population size of the King Rail in Canada. Long-term objectives are to prevent any decline of the existing population, and to increase the breeding population to 250 well-established pairs that breed regularly in at least 10 separate wetlands. Recovery activities thus far include promoting awareness of the species and its conservation to landowners; restoring wetlands adjacent to core King Rail breeding habitat in the St. Clair area; research on wetland plant ecology and methods for management of invasive plants found in King Rail breeding sites; and initiation of outreach and communication project directed at marsh owners and managers

(http://www.speciesatrisk.gc.ca/search/speciesDetails_e.cfm?SpeciesID=24).

The U.S. and Canadian Whooping Crane Recovery Plans call for the establishment of additional wild Whooping Crane populations. Currently one objective is a flock of 125 birds by 2020, including 25 or more breeding pairs of migratory whoopers, to be introduced in central Wisconsin. In 2001, the first flock of Whooping Cranes, consisting of seven cranes hatched and reared at USGS's Patuxent Wildlife Research Center, was introduced to Wisconsin's Necedah National Wildlife Refuge (NWR) (BCR 23), the proposed summering area for the new flock. This flock was led from Necedah NWR behind an ultralight aircraft operated by pilots from Operation Migration to winter at Chassahowizka NWR, Florida, the proposed wintering area. This new migratory flock is designated as a Nonessential Experimental Population. Under this designation, the reintroduced cranes will not receive full Endangered Species Act protection to

allow greater management flexibility and resolve possible conflicts between people and Whooping Crane conservation (Whooping Crane Eastern Partnership 2005). There are currently 42 Whooping Cranes in the wild in the UMVGL Region as a result of the first four years of reintroductions (2001-2004) into the eastern flock. The veteran cranes from these reintroductions are monitored by the International Crane Foundation and the USFWS, and most have returned from Florida on their own. Many of these cranes spend the summer on public and private lands in central Wisconsin. Intensive effort to rear chicks and assist them in migration is undertaken annually by a team consisting of state, provincial and federal agencies, non-government organizations, and private citizens. Over 25 private landowners have offered their land as stopovers for the cranes, planes, and migration team of biologists, pilots, and communication experts. State and Federal wildlife refuges and other public properties are also utilized as stopover sites during the migration.

The Interior Least Tern Recovery Plan established population objectives for birds that occur in areas of BCRs 22 and 24. However, the recovery plan is due for updating, as it 15 years old and the proposed date of recovery (initiation of delisting) was 2005 (USDI/FWS 1990). Several refuges in BCRs 22 and 24 provide habitat for Least Terns (see Appendix B). More information on recovery objectives is provided in Appendix A and Chapter 7.

In many areas in the Great Lakes region, conflicts with gulls (Ring-billed and Herring Gulls) occur frequently. The current policy in the U. S. for management and control of gulls involves issuing site-specific depredation permits to allow “destruction of gull nests and eggs and limited killing of adult and sub-adult gulls to protect property, for public health and safety reasons, and to benefit other colonial waterbirds under the Migratory Bird Treaty Act

(USDI/FWS 2000). In Canada, the CWS issues permits to control gull numbers in situations where it is believed to be warranted.

2.d.iv Habitat protection, restoration and management

The section summarizes avenues by which waterbird habitat protection, restoration and management activities are undertaken within the Region.

Federally managed sites. The National Wildlife Refuge System (NWRS) of the U.S. is the largest and most diverse collection of lands and waters set aside specifically for wildlife. Varying in size from half-acre parcels to thousands of square miles, they encompass more than 92 million acres of the nation's best wildlife habitats. Though most refuges were created to provide habitat for waterfowl, and are managed to meet waterfowl habitat needs, many refuges provide high quality habitat for waterbirds. Through the NAWCP, USFWS is now focusing more attention to management of refuge lands for waterbirds; a number of refuges within the Region undertake specific management actions for waterbird species such as rails, terns, and wading birds. Appendix B provides detailed information on National Wildlife Refuges within the Region that provide important habitat for waterbirds.

The National Park System contains four National Lakeshores; all are in the UMVGL Region and all are significant for waterbirds. These National Lakeshores include the Apostle Islands, Wisconsin; Indiana Dunes, Indiana; and Sleeping Bear Dunes and Pictured Rocks, Michigan. Combined, these lakeshores encompass > 200,000 acres, much of which is used by breeding, foraging and resting waterbirds.

In Canada, federal lands include National Parks, National Wildlife Areas, and Migratory Bird Sanctuaries. The National Park system covers 2.5 per cent of the country and protects important landscapes in which can be found globally significant wildlife populations and habitats

of endangered species. The park system began in 1885 and currently includes 41 national parks. They range in size from just under 9 km² (3.474 miles²) to almost 45,000 km² (17,370 miles²). National parks are established to protect and present the best representative examples of natural landscapes and natural phenomena that occur in Canada's natural regions.

National Wildlife Areas (NWAs) were established as a result of the 1973 Canada Wildlife Act to protect both wildlife, especially migratory wildlife and species at risk, and their habitat. There are 51 NWAs across Canada, protecting a total of over 529, 000 hectares (1,306,630 acres). They are managed for wildlife research, conservation, and public education. In some locations, regulated hunting is permitted. CWS prepares a management plan for each NWA with the involvement of local communities. The plan specifies activities that are generally allowed and identifies additional activities to be allowed under permit.

Migratory Bird Sanctuaries (MBS) encompass approximately 11.2 million hectares (27,664,000 acres) and protect habitat of thousands of migratory birds. The first MBS was established in 1917 after the passing of the Migratory Birds Convention Act between Canada and the U.S. Presently there are 92 sanctuaries across Canada. Disturbance of migratory birds, their eggs, and their nests within an MBS is prohibited and hunting of listed species is not permitted. Environment Canada is the agency responsible for MBSs, but the actual properties can be owned federally, provincially, or privately. Management includes monitoring wildlife, maintaining and improving wildlife habitat, periodic inspections, enforcement of hunting prohibitions and regulations, and the maintenance of signs. Research is also an important function and at some sites it is coordinated and carried out by CWS staff.

State / Provincial Wildlife Management Areas. State and Provincial Wildlife Management Areas (WMAs) are public lands that provide millions of acres of habitat for

multiple waterbird species. Important habitat types include wetlands, grasslands and bottomland hardwoods. These areas are managed to provide food, winter cover, and secure nesting habitat for resident and migratory wildlife species, and to provide public hunting opportunities. Detailed assessment of waterbird habitat on WMAs within the UMVGL Region was beyond the scope of this plan, but it will be an important “next step” in determining where there are habitat conservation opportunities.

Non-Governmental Organizations. There are a variety of non-governmental organizations (NGOs) in the region that work to conserve, protect and manage waterbird habitat. The Nature Conservancy helps preserve millions of acres of lands and waters across the continent through chapters in all 50 U.S. states and programs in Canada and Mexico. There are a variety of programs in place in the UMVGL Region. One very significant one is the Conservancy’s Great Lakes Program developed its Conservation Blueprint for the Great Lakes, a broad yet practical plan for conserving and protecting the natural life of this region. The Great Lakes Program develops and implements strategies to address the main threats to Great Lakes. This program works together with the Conservancy’s eight Great Lakes state programs, Conservancy-wide initiatives, worldwide office and partners to accomplish the goals of the plan.

Ducks Unlimited and Ducks Unlimited Canada conserve, restore, and manage wetlands and associated waterfowl habitats across North America. Their efforts to conserve wetland habitat also benefit other wetland dependent wildlife. In the UMVGL Region there are major conservation/restoration initiatives in both the Great Lakes and the Upper Mississippi River ecosystems. Conservation efforts of these partner NGOs take many forms. On-the-ground work includes wetland and environmental research. Policy development to change policy in favor of

wetland and habitat conservation is pursued, and wetland and environmental education programs are also provided.

Wildlife Habitat Canada (WHC) is a national, non-profit, conservation organization established in 1984 by Environment Canada, provincial wildlife agencies and conservation agencies to champion wildlife habitat stewardship by building capacity in the conservation community and affecting change in policies and practices having an impact on habitats. WHC works through partnerships with communities, landowners, governments, non-governmental organizations, and industry to find effective solutions to complex environmental problems facing wildlife habitat.

Joint Ventures. The North American Waterfowl Management Plan (NAWMP) has a number of objectives relating to waterfowl habitat and populations, and is based on the principle of collaborative organizations that serve as a framework for the activities of its partners. These so-called Joint Ventures (JVs) are comprised of individuals, corporations, conservation organizations, and local, state, provincial, and Federal agencies. Their original role was to develop implementation plans focusing on areas of concern identified in NAWMP, restoring and enhancing wetlands and associated uplands habitats. This focus implicitly benefits waterbirds and other wetland species. In recent years, JVs have expanded their focus to become all-bird initiatives; in some cases, this has resulted in specific planning and on-the-ground conservation for waterbirds and addition of waterbird biologists to Joint Venture Technical Committees. Most JVs are now committed to explicitly providing habitat protection, restoration and management goals for waterbirds. The UMVGL waterbird planning region is overlapped by five JVs: the Eastern Habitat Joint Venture (EHJV, overlapping BCRs 12 and 13), the Atlantic Coast Joint Venture (ACJV, overlapping BCRs 12 and 13), the Upper Mississippi River/Great Lakes Region

Joint Venture (UMVGLJV, overlapping BCRs 12, 22, and 23), the Central Hardwoods Joint Venture (CHJV, comprised of BCR 24), and, minimally, by the Lower Mississippi Valley Joint Venture (LMVJV). One primary source of funding for JV activities is through North American Wetland Conservation Act (NAWCA) grants to partners for wetland conservation, which have major benefits for most waterbirds in the region. However, some JVs obtain more substantial funding through partners than through NAWCA.

Private Lands Programs. Also important for waterbird and other wetland-dependent species habitat conservation are agricultural programs that protect and restore wetlands on private lands, especially ephemeral, temporary, and seasonal sites. These programs include: (1) the U. S. Department of Agriculture's Wetland Reserve Program, in which permanent conservation easements are purchased on restored wetlands, (2) the USDA's Conservation Reserve Enhancement Program, which provides restoration and long-term protection of habitat on agricultural lands in riverine floodplains in a number of states, and (3) the Farm Service Agency's Inventory Property Easement Program, which protects lands containing significant wildlife habitat. Preservation of existing wetlands through the enforcement of Federal and state wetland protection laws and permits is another important tool in conserving waterbird habitats.

2.d.v Public education and outreach

The UMGVL is fairly well positioned to conduct public education and outreach activities, with many means in place to reach the public with waterbird conservation messages, especially around the Great Lakes. Some of the Region's well-established efforts are mentioned here; all should be targeted for help in communicating messages specifically needed for waterbird conservation.

The public land agencies emphasize constituent education. Through the USFWS and the CWS, multiple outreach products have been produced and often emphasize constituent education. Products include fact sheets, strategic action plans and videos that are available electronically, at visitor centers, or by writing the agencies. The USFWS' Great Lakes Basin Ecosystem Team (GLBET) has a Great Lakes Islands Committee which focuses on island conservation and the importance of these islands to migratory birds, especially colonial waterbirds. GLBET has several outreach products ready for use and is in the process of completing others, including GLBET Outreach Committee 2004 Strategic Action Plans and a video.

There are a number of public-private entities that reach out with bird conservation-related messages. The Center for Great Lakes Environmental Education promotes learning links for teachers, students and other stakeholders in the international Great Lakes-St. Lawrence basin ecosystem and increases awareness of and access to information about Great Lakes environmental subjects. JVs also have an outreach goal, primarily to exchange information on regional bird conservation issues with JV partners, and to pool knowledge when developing strategic plans used to provide long-term partner guidance in bird conservation.

Non-governmental organizations are a significant means of public education and outreach. There are several land stewardships and conservancies actively conducting outreach and education activities, including The Nature Conservancy and the Great Lakes Bioregional Land Conservancy. Conservancies often put together extensive outreach materials that provide specific information about areas of conservation value and actively distribute materials to key stakeholders. The Audubon Society, both national and local chapters, conducts extensive outreach work through the use of displays, school education programs, volunteer-involvement

programs like Christmas Bird Counts and Citizen Science, community-wide projects, tours of natural areas, development of brochures, newsletters and the national magazine, and letter-writing campaigns. In the UMVGL Region, most local Audubon chapters have conducted extensive outreach for their Important Bird Areas (IBA) programs, including production of suitable educational materials that describe the biology and habitat needs of show-case species at particular sites, education and outreach activities at particular sites, communication of habitat needs and research results to stewardship groups and the general public, and the involvement of the public with ongoing monitoring efforts. In Canada, local naturalists clubs and the Federation of Ontario Naturalists (FON) function much like Audubon societies; these entities have taken the lead in promoting local IBAs in Canada.

Bird Studies Canada's Great Lakes Marsh Monitoring Program also utilizes volunteer naturalists and birders to conduct marsh monitoring activities, and has developed a newsletter and other information on its activities accessible through its website. This effort is very important in creating awareness of conservation issues facing the least known group of waterbirds, the marsh birds. The numerous bird observatories in the Region (Table 2.2) are all non-profit organizations devoted to wildlife research, monitoring, conservation, and educational programs for the public. Many have birding trails and provide unique opportunities for public participation and recreation.

International Migratory Bird Day is a means of education through celebration, and it is observed throughout the UMVGL Region. Created in 1993, and primarily under the direction of the National Fish and Wildlife Foundation and USFWS, the event focuses attention on birds and bird conservation during the migration season. It is celebrated annually at dozens of events in the UMVGL Region, many of which are large public festivals. Extensive information and

education materials are available at the International Migratory Bird Day website (www.birdday.org). Each year has a particular theme; in 2004, the theme was colonial waterbird conservation.

Some waterbird species have “fan clubs”, i.e., groups of people and/or organizations that undertake specific actions to learn about and help conserve them. Loon Watch is an organization that has been observing Common Loons in many parts of the Region for more than 10 years. "Loon Rangers" are volunteers that record nesting behaviors and successes each year on specific lakes. Other special programs for loons are undertaken in the Region by the Michigan Loon Preservation Association, and the Department of Natural Resources in Michigan, Minnesota and Wisconsin. The International Crane Foundation (ICF) is an organization located in Baraboo, Wisconsin (BCR 23) that works worldwide to conserve cranes. ICF uses a wide range of education and conservation activities directed toward the many countries where cranes occur. In the UMVGL Region, ICF conducts outreach programs such as the Annual Midwest Sandhill Crane Count. People from Wisconsin and neighboring states visit their site and participate in the Sandhill Crane Count. ICF also has national outreach activities, films, and national media coverage of their programs. ICF maintains a collection of captive cranes for captive breeding and reintroduction into the wild programs. Through their efforts with highly charismatic waterbird species, such as loons and cranes, these species-specific preservation organizations have the potential to successfully communicate waterbird conservation messages and garner broad support for the diverse waterbird group.

Figure 1. The Upper Mississippi Valley /Great Lakes Waterbird Planning Region. Bird Conservation Regions (BCRs) include Boreal Hardwood Transition (BCR 12), Lower Great Lakes / St. Lawrence Plain (BCR 13), Eastern Tallgrass Prairie (BCR 22), Prairie Hardwood Transition (BCR 23), and Central Hardwoods (BCR 24).

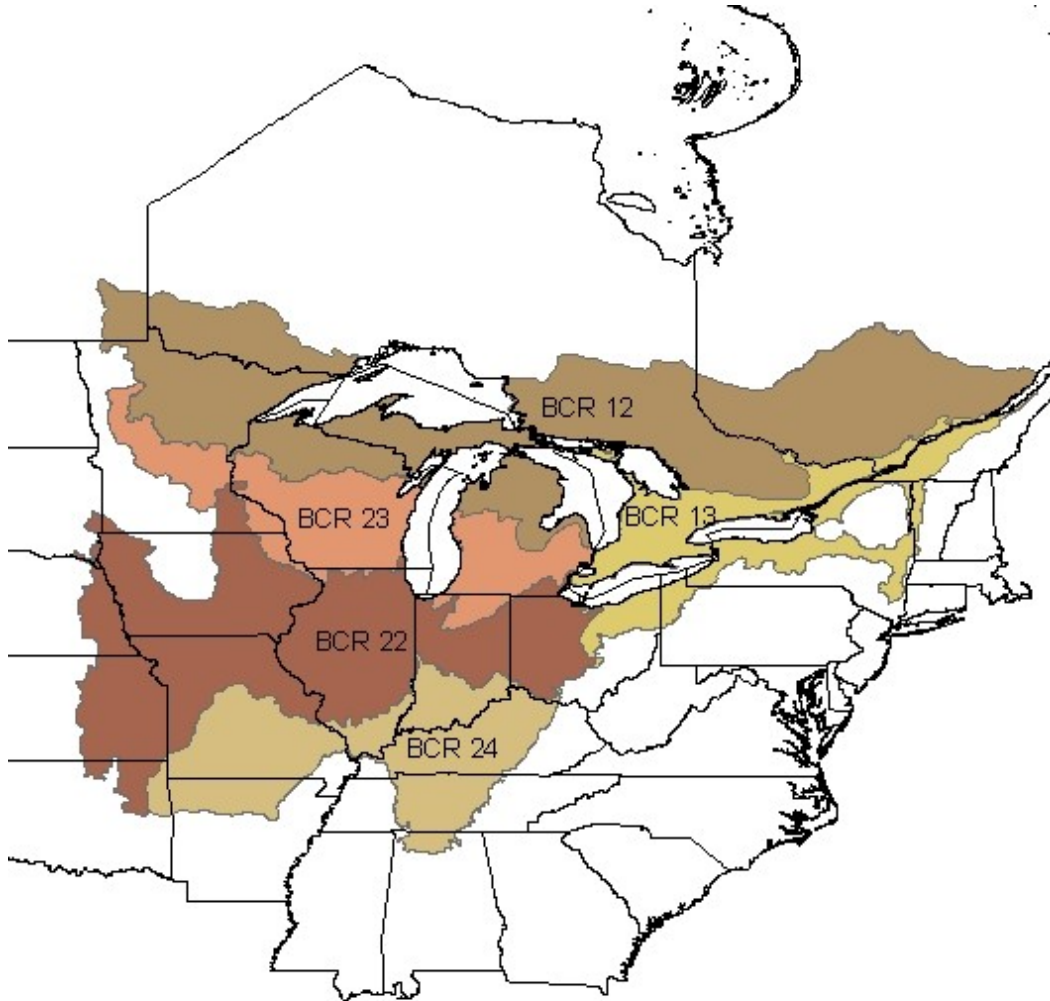


Table 2.1. Inventory and monitoring efforts currently undertaken for waterbirds in the Upper Mississippi Valley Great Lakes Region.

<i>National Programs / Regional Efforts</i>						
State / Prov / Area	Effort / Geographic Scope	Species ¹	Method	Frequency	Sampling Strategy	Contact
All	Breeding Bird Survey, Continent	All	Point count	Annual	Roadside survey routes	http://www.mbr-pwrc.usgs.gov/bbs/bbs.html
All	Christmas Bird Count, Continent	All	Point count	Annual	Survey circles	http://www.mbr-pwrc.usgs.gov/bbs/cbc.html
CAN Great Lakes: (ONT)	Great Lakes Colonial Waterbird Survey, Canadian Great Lakes	Colonial waterbirds	Nest counts	Once / 10 years	Complete census	C. Weseloh, CWS, Chip.Weseloh@ec.gc.ca
U.S. Great Lakes:	Great Lakes Colonial Waterbird Survey, US Great Lakes	Colonial waterbirds	Nest counts	Once / 10 years	Complete census	F. Cuthbert, U of MN, cuthb001@umn.edu
Great Lakes Basin	Marsh Monitoring Program, Great Lakes Coastal Wetlands	Marshbirds	Playback counts	Annual	Survey routes	S. Timmermans, Bird Studies Canada, stimmermans@bsc-eoc.org
UMVGL Region	National Marsh Bird Monitoring Program	Marshbirds	Broadcast calls / Passive observation	Annual	Survey routes	C. Conway, AZ Coop Fish & Wildlife Unit, USGS cconway@ag.arizona.edu
<i>State / Provincial Programs</i>						
All (except MN)	Breeding Bird Atlas, State-/Province-wide	All	Point / visual counts	Varies by state/province	Survey blocks	
AL	No information obtained					
AR	No information obtained					
IL	No information obtained					
IN	Indiana Colonial Waterbird Survey, Statewide	GBHE ¹ , GREG, BCNH, CATE, RBGU, HERG, SNEG, CAEG, LBHE, DCCO	Complete counts of active nests	Every 3-5 years	Complete census	J. Castrale, IN Dept. Nat. Res, jcastrale@dnr.IN.gov
IN	LETE Monitoring, Southwestern Indiana	LETE	Counts of nests, nest success, young fledged	Annually	Complete	

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State / Prov / Area	Effort / Geographic Scope	Species¹	Method	Frequency	Sampling Strategy	Contact
IA	No information obtained					
KS	Colonial Waterbirds, Statewide	BCNH, YCNH, WFIB, GREG, SNEG, LBHE	Visual count nesting pairs	Irregular / infrequent	Non-standard, opportunistic	B. Busby, Kansas Biological Survey, wbusby@ku.edu
KS	Marshbirds, Statewide	BLRA, VIRA, KIRA, SORA, AMBI, LEBI	Visual count nesting pairs	Irregular / infrequent	Non-standard, opportunistic	
KY	No information obtained					
MI	No statewide survey for waterbirds	Waterbirds				R. Rustem, MI Dept. Nat. Res., Rustemr@michigan.gov
MI	Breeding Bird Atlas, update marshbird information	Marshbirds	Breeding Bird Atlas	Every 10 years	Statewide	Ray Adams, Kalamazoo Nature Center, radams@naturecenter.org
MI	Marshbird Survey, Seney National Wildlife Refuge	AMBI, VIRA, SORA, YERA, BLTE	Surveys and or samples of fixed routes for index	Annual if possible, otherwise variable	Sample	T. Casselman, Tracy_Casselman@fws.g ov
MI	COLO Census, Seney National Wildlife Refuge	COLO	Complete population census	Annual if possible, otherwise variable	Complete census	“
MI	Colonial Waterbird Monitoring, Lake Michigan islands Hat, Pismire, Gull	CATE, DCCO, HERG, RBGU	Nest counts, colony size estimates	Annual if possible, otherwise variable	Complete counts and extrapolation	“
MI	St. Ignace and Brevort (Sand Products)	COTE	Complete nest count	Annual	Complete census	“
MN	Colonial Waterbird Monitoring, Statewide	Grebes, gulls, herons, egrets, FOTE, DCCO, AWPE	Nest count	Annual if possible, otherwise variable	All large colonies	K. Haws, MN Dept. Nat. Res. katie.haws@dnr.state.mn. us
MN	COLO Monitoring Project, BCR 12, 23	COLO	Individuals	Annual	Index	P. Perry, MN Dept. Nat. Res.
MN	County Biological Survey YERA Inventory, Statewide	YE RA	Info not provided	Variable	Presence / absence	S. Stucker, MN Dept. Nat. Res., steve.stucker@dnr.state. mn.us
MN	COTE Monitoring, Statewide	COTE	Nest count, productivity	Annual	Complete	K. Haws, MN Dept. Nat. Res. katie.haws@dnr.state.mn. us
MO	No information obtained					

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State / Prov / Area	Effort / Geographic Scope	Species¹	Method	Frequency	Sampling Strategy	Contact
NE	No information obtained					
NY	No information obtained					
OH	Colonial waterbirds, Western Basin Lake Erie	colonial waterbirds	Nest count	Annual	Complete counts and extrapolation	M. Shieldcastle, OH Dept. Nat. Res., Mark.Shieldcastle@dnr.state.oh.us
OH	COTE Survey, Western Basin Lake Erie	COTE	Complete	Annual	Complete counts	“
OH	Rail Monitoring, Statewide	Rails	Playback	Annual	Index	
OK	No information obtained					
ON	DCCO and CATE Survey, Lakes Ontario and Erie	DCCO, CATE	Nest count	Annual	Complete census	C. Weseloh, Canadian Wildlife Service, Chip.Weseloh@ec.gc.ca
ON	Hamilton Harbor Colonial Waterbird Survey, Hamilton Harbor Lake Ontario	RBGU, HERG, GBBG, CATE, COTE, BCNH, DCCO	Nest count	Annual	Complete census	Cynthia Pekarik, Canadian Wildlife Service, C.Pekarik@ec.gc.ca
ON	OMNR Species at Risk program	BLTE, LEBI, KIRA	Territorial presence	Annual	Info not provided	Margaret.McLaren@mnr.gov.on.ca
ON	2nd Ontario Breeding Bird Atlas, OMNR, CWS, Ontario Nature, Bird Studies Canada	All waterbirds	Nesting and numbers	Irregular	Breeding Bird Atlas Surveys, 2001-2005	Mike.cadman@ec.gc.ca
ON	Toronto Region Conservation Authority (TRCA), Tommy Thompson Park, Toronto Harbour	COTE, CATE, DCCO, BCNH	Nest count	Annual	Complete census	T. Chippenfield and R. Toner, TRCA, 416-661-6600
PA	Marshbird Monitoring, mainly Conneaut Marsh, Crawford Co.	All marshbirds	Playback; NA marshbird protocol; distance sampling;	Large marshes every 5 years, small marshes every 10 years	Highly stratified	D. Brauning, PA Game Commission, dbrauning@state.pa.us
PA	Game Take Survey, Statewide	Hunted rails	Mail survey	Annual	Info not provided	“
PA	Threatened and Endangered Wading Bird Survey, Statewide	GREG, BCNH	Nest count	Annual	Complete	“
PA	DCCO Monitoring, State's only colony	DCCO	Nest count	Annual	Complete	“

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State / Prov / Area	Effort / Geographic Scope	Species¹	Method	Frequency	Sampling Strategy	Contact
PA	GBHE Monitoring, Statewide	GBHE	Nest count	All colonies every 5 years, large colonies annually	Partial / Complete	“
QC	Parks Canada COLO Survey, La Mauricie National Park of Canada (BCR 12)	COLO	Pair count	Annual	Info not provided	J.F. Rail, Canadian Wildlife Service, Jean-Francois.Rail@EC.GC.CA
QC	Canadian Lake COLO Survey, Canadian lakes	COLO	Pair count	Variable	Partial in time and space	Bird Studies Canada
QC	GBHE Monitoring, QB BCR 12, 13	GBHE	Nest count	Irregular / infrequent	Complete	J.F. Rail, Canadian Wildlife Service, Jean-Francois.Rail@EC.GC.CA
QC	DCCO Monitoring, QB BCR 13	DCCO	Nest count	Irregular / infrequent	Complete	“
QC	Species at Risk Program, Province-wide	YERA, HOGH	Info not provided	Info not provided	Info not provided	“
SD	No information obtained					
TN	No information obtained					
VT	No information obtained					
WI	Loon Watch, Northern WI	COLO	Nest count, young production	Early spring-late fall	Conducted by Sigurd Olson Environmental Institute (SOEI)	SOEI, 715-682-1223
WI	WI Breeding Bird Atlas Project	Marshbirds, Waterbirds	Nesting and numbers		Breeding Bird Atlas surveys, 1995-2000	Bettie Harriman, Director
WI	SWG WI Wetland Bird Monitoring and Management	Marshbirds, Waterbirds	Breeding bird surveys, playback response	Spring/summer 2006-07		
WI	Wisconsin DNR Pittman-Robertson Nongame Bird Surveys,, Statewide	RNGR	Nest count, young production	Annual / variable	Non-random sampling	S. Matteson, WI DNR. ,MatteS@mail01.dnr.state.wi.us
WI	Wisconsin DNR Pittman-Robertson Nongame Bird Surveys, East-central WI	WEGR	Nest count, young production	Annual / variable	Complete census	“
WI	UW-Green Bay, USFWS, and Pittman-Robertson Nongame Bird Surveys, Statewide	GREG	Nest count	Annual / variable	Non-random sampling	S. Matteson, T. Erdman, E. Nelson, T. Ziebell
WI	UW-Green Bay and Pittman-Robertson Nongame Bird Surveys, Green Bay	SNEG	Nest count, young production	Annual / variable	Complete census	T. Erdman, S. Matteson
WI	SACR Count, Statewide	SACR	Observer counts	Annual spring	Statewide census	Intl. Crane Foundation, 608-356-9462

State / Prov / Area	Effort / Geographic Scope	Species ¹	Method	Frequency	Sampling Strategy	Contact
WI	UW-Green Bay and Pittman-Robertson Nongame Bird Surveys, Statewide	AWPE	Nest counts	Annual spring	Complete census	S. Matteson, T. Erdman, FWS
WI	DCCO Population Survey, Statewide	DCCO	Nest counts	Variable	Complete census	S. Matteson, USDA Wildlife Services, E. Nelson
WI	BLTE Survey, Statewide	BLTE	Roadside transects	1980-82, 1995-97	Non-random sampling	S. Matteson, M. Mossman
WI	Pittman-Robertson Nongame Bird Surveys, Statewide	CATE	Nest counts	Annual / variable	Complete census	S. Matteson
WI	WBCI, Pittman-Robertson Nongame Bird Surveys, private, FWS, Loras College	FOTE	Nest counts, young production	Annual/variable	Complete census	S. Matteson, A. Techlow, D. Christensen, D. Shealor, T. Peters, T. Ziebell, FWS
WI	WBCI, Pittman-Robertson Nongame Bird Surveys, Statewide	COTE	Nest counts, young production	Annual / variable	Complete census	S. Matteson, F. Strand, A. Techlow, T. Ziebell
WI	U.S. Fish and Wildlife Service Incidental, Green Bay/L. MI	GBBG	Nest counts	Annual / variable	Non-random sampling	K. Stromborg, USFWS
WI	WI Colonial Waterbird Survey	All	Nest counts; br. adult count	Annual/Variable	Web-based, non-random sampling	WDNR, FWS, NPS, Pvt.
WI	Lake Superior Colonial Waterbirds, Lake Superior	HEGU, RBGU, DCCO, COTE, GBHE	Nest counts	Every 5 yrs	Complete census	S. Matteson (WI DNR), J. Van Stappen (NPS), F. Strand, S. LaValley

1 = Common and scientific names corresponding to species abbreviations are given in Tables 3.1 and 3.2.

Table 2.2. Bird Observatories in the Upper Mississippi Valley/Great Lakes Region

<i>Observatory</i>	<i>State/Province</i>
Black Swamp Bird Observatory	Ohio
Braddock Bay Bird Observatory	New York
Bruce Peninsula Bird Observatory	Ontario
Chicagoland Bird Observatory	Illinois
Chipper Woods Bird Observatory	Indiana
Cornell Laboratory of Ornithology	New York
Holiday Beach Migration Observatory	Ontario
Innis Point Bird Observatory	Ontario
Long Point Bird Observatory	Ontario
Rouge River Bird Observatory	Michigan
Toronto Bird Observatory	Ontario
Whitefish Point Bird Observatory	Michigan